UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/683,286 | 12/10/2001 | Tadashi Takano | SIMTEK6227 | 8443 |

25776 7590 10/22/2003

ERNEST A. BEUTLER
ATTORNEY AT LAW
500 NEWPORT CENTER DRIVE
SUITE 945
NEWPORT BEACH, CA 92660

| EXAMINER | |
|---|---|
| LE, DANG D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2834 | |

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov



**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Paper No. 1003

Application Number: 09/683,286
Filing Date: December 10, 2001
Appellant(s): TAKANO ET AL.

Kabushiki Kaisha Moric
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed August 12, 2003.

***(1) Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

***(2) Related Appeals and Interferences***

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

***(3) Status of Claims***

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 1, 2, 4, 5, 7, 9, 11, 13 and 14. Claim 12 was canceled in paper dated January 13, 2003 and the applicants missed claim 14.

***(4) Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

***(5) Summary of Invention***

The summary of invention contained in the brief is correct.

***(6) Issues***

The appellant's statement of the issues in the brief is correct.

***(7) Grouping of Claims***

Appellant's brief includes a statement that claims 1, 2, 4, 5, 7, 9, 11, 13, and 14 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

***(8) Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

***(9) Prior Art of Record***

| | | |
|---|---|---|
| 4,774,428 | KONECNY | 9-1988 |
| 5,900,687 | KONDO ET AL. | 5-1999 |
| 5,107,159 | KORDIK | 4-1992 |
| 6,081,058 | SUZUKI ET AL. | 6-2000 |

***(10) Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konecny in view of Kondo et al.

Regarding claim 1, Konecny shows a permanent magnet rotary electric machine (Figures 1 and 2) having a rotor (14) and a stator (20), one of said rotor (14) and said stator comprising a plurality of permanent magnets (16) disposed such that polarities of adjacent magnets are different from each other (N vs. S), the other of said rotor and said stator (20) comprising a plurality of electrical coils (A', B', and C') wound around cores (A1 to C3) juxtaposed to said permanent magnets for cooperation therewith, said coil windings being arranged in groups of coil windings (Figure 2A), no two coil windings of each group being circumferentially adjacent to the other (Figures 2A and 2B).

Konecny does not show the coil windings of the groups having their windings connected to each other and common ends. Konecny neither shows any structure to connect the three-phase windings. Konecny just shows the coil windings of the groups being continuously.

Kondo et al. provide a structure (7) to connect the coil windings (2) of the groups having their windings connected to each other (conductors 3-5 for phases U-W and 6 for common ends) for the purpose of reducing time.

Since Konecny and Kondo et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to separate the windings of each phase and connect them to each other as taught by Kondo et al. for the purpose discussed above.

Regarding claim 13, it is noted that Konecny also shows the coil windings of each group (A') are circumferentially separated (Figure 2A) from each other by at least one coil winding of another group.

Regarding claim 14, it is noted that Konecny also shows coil windings being formed around each of the cores (Figure 2 and 2A and column 4, lines 18-30).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Konecny in view of Kondo et al. as applied to claim 1 above, and further in view of Kordik.

Regarding claim 2, the machine of Konecny modified by Kondo et al. shows all of the limitations of the claimed invention except for one of the cores and the permanent magnets disposed in nonsymmetrical relation to the axis of rotation of said machine.

Kordik shows one of the cores and the permanent magnets disposed in nonsymmetrical relation to the axis of rotation of said machine (Figure 1-4) for the purpose of providing a constant positive torque.

Since Konecny, Kondo et al., and Kordik are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to dispose one of the cores and the permanent magnets

in nonsymmetrical relation to the axis of rotation of said machine as taught by Kordik for the purpose discussed above.

Claims 4, 5, 7, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konecny in view of Kondo et al. and Kordik as applied to claim 2 above, and further in view of Suzuki et al.

Regarding claim 4, the machine of Konecny modified by Kondo et al. and Kordik shows all of the limitations of the claimed invention including all the permanent magnets being of substantially of the same shape except a circumferential offset angle of each permanent magnet from a regularly disposed position being set such that a cogging number per rotation of the rotor is equivalent to as the least common multiple of the number S of slots between the electrical winding cores and the number P of magnetic poles.

Suzuki et al. show a circumferential offset angle of each permanent magnet from a regularly disposed position being set such that a cogging number per rotation of the rotor is equivalent to as the least common multiple of the number S of slots (12 slots in Figure 5), between the electrical winding cores (4a-4l) and the number P (16 poles in Figure 5) of magnetic poles (9 in Figure 6) for the purpose of reducing irregularity of the rotation. Also see column 4.

Since Konecny, Kondo et al., Kordik, and Suzuki et al. are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to set a circumferential offset angle of each permanent magnet from a regularly disposed position such that a cogging number per rotation of the rotor is equivalent to as the least common multiple of the number S of slots between the electrical winding cores and the number P of magnetic poles as taught by Suzuki et al. for the purpose discussed above.

Regarding claim 5, it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the magnitude of the torque exerted on each permanent magnet separately by a computer numerical analysis and peaks or bottoms of the torque curves of said permanent magnets are offset from each other with respect to the rotation angle of the rotor so that the cogging number is increased, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 7, it would have been obvious to one having ordinary skill in the art at the time the invention was made to set the number S of slots eighteen, the number P of magnetic poles twelve, and divide the twelve permanent magnets are into four sets, each set comprising three circumferentially adjacent permanent magnets, the circumferential pitch angle of the three permanent magnets of each set being 26.7 degrees and the circumferential pitch angle of adjacent two permanent magnets between the sets being 36.60 degrees, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 9, it would have been obvious to one having ordinary skill in the art at the time the invention was made to set the number S of slots eighteen, the number P of magnetic poles twelve, and divide the twelve permanent magnets into four sets, two of said four sets comprising three circumferentially adjacent permanent magnets, the circumferential pitch angle of the three permanent magnets of each set being 26.7 degrees and the circumferential pitch angle of permanent magnets within the other two sets disposed at a symmetrical position being 33.3 degrees, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 11, it would have been obvious to one having ordinary skill in the art at the time the invention was made to set the number S of slots eighteen, the number P of magnetic poles twelve, and divide the twelve permanent magnets into four sets of three circumferentially adjacent permanent magnets, the circumferential pitch angle of the three permanent magnets of each set being 28.3 degrees circumferential pitch angles of adjacent permanent magnets between adjacent different sets being set to 33.3, 28.3, 33.3, and 28.3 degrees circumferentially in this order, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

***(11) Response to Argument***

First of all, the examiner would like to point out that besides providing maximum energy efficiency, Konecny's goal is to reduce torque ripple, which is known in the art of motor and generator as cogging torque. See column 1, lines 45-53, and column 2, lines

18-30. Konecny can also reduce unbalanced magnetic forces as disclosed in Figures 2-2B because harmful vibration can be reduced.

It is further noted that the applicants do not contest the combination of Konecny and Kondo et al. Instead, the applicants argue that Konecny does not show "no two coil windings of each group being circumferentially adjacent to each other". Figure 2A of Konecny clearly shows that the coil windings (A'1-A'3) are separated by the coil windings (C'3 and B'1). Such distribution is well known in the art of motor and generator. In fact, Kondo et al. also provide the same distribution with U, V, and W coils being disposed in the circumferential order. See Figures 1 and 2, positions of connector 3b and 3a, and column 3, lines 11-40.

Regarding the applicants' argument to claims 13 and 14, Kondo et al. also show the limitations of these claims as discussed above. The U-phase windings are separated by the V and W phases. See column 3, lines 13-23.

Regarding the applicants' argument to claim 2, it is noted that the motivation in the prior art to combine references need not be identical to that of the applicant to establish obvious. In re Kemps, 40 USPQ2d 1309, (Fed. Cir. 1996). It would have been obvious to one having ordinary skill in the art to modify the motor of Konecny or Kondo et al. with nonsymmetrical relation between the stator and the rotor for the purposes listed in column 2 of Kordik.

In addition, although the embodiment of Figure 2 in Kordik shows some coils of the groups of coils are on adjacent poles, the connection configuration of Kondo et al. would provide a neat connection and eliminate the problem of two coil windings being

circumferentially adjacent to each other by a single coil crossing over the unwound poles (56 in Figure 2).

Regarding the applicants' argument to claim 4, Suzuki et al. do show the permanent magnets being the same shape in Figures 5 and 6.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

October 10, 2003

Conferees
Dang Le
Karl Tamai
Olik Chaudhuri

DANG LE
PRIMARY EXAMINER

ERNEST A. BEUTLER
ATTORNEY AT LAW
500 NEWPORT CENTER DRIVE
SUITE 945
NEWPORT BEACH, CA 92660